2. CURRENT AND FUTURE TRAINING REQUIREMENTS

The Department of Defense operates the largest and most diverse training enterprise in the world to support its 3.2 million uniformed and civilian personnel, operating from more than 6,000 locations, using more than 30 million acres of land, in 146 countries. We provide entry-level qualification training to about 200,000 new soldiers, sailors, marines, and airmen each year. We also provide specialized skill training, beyond that acquired in basic training, to develop expertise for specific job requirements. We teach leadership skills for military units of every size, from small groups to large joint combat task forces, and provide professional development education to our noncommissioned and commissioned officers. Military training and education cover an astounding variety of subjects, from basic weapons familiarization to advanced operational art for effective employment of joint combat forces.

The National Security Strategy of the United States directs the major institutions of American national security to transform to meet the challenges of the Twenty-First Century. The Department has fully embraced this direction. Our experiences in Afghanistan and Iraq reinforce the need to transform training to better enable joint operations against an often-unknown threat. Today we deploy our forces to combatant commands for employment in joint operations. We therefore must train as we fight—jointly.

The Congress has helped the Department foster jointness in the past by codifying direction in public law, for example, in various sections of Title 10 of the United States Code:

- Section 153 states that "subject to the authority, direction, and control of the President and the Secretary of Defense, the Chairman of the Joint Chiefs of Staff is responsible for developing doctrine for the joint employment of the Armed Forces, formulating policies for the joint training of the Armed Force, and formulating policies for coordinating the military education and training of members of the Armed Forces."

- Section 164(c) outlines the authority of combatant commanders, and includes among these, "giving authoritative direction to subordinate commands and forces necessary to carry out missions assigned to the command, including authoritative direction over all aspects of military operations, joint training, and logistics."

- Section 165(b) states that, "subject to the authority, direction, and control of the Secretary of Defense and subject to the authority of the combatant commands (under 164(c)), the Secretary of the Military Department is responsible for the administration and support of forces assigned by him to a combatant command."

- Additional Military Service training responsibilities are fixed in the individual Service sections of Title 10. Specifically, 10 USC 3013(b), 5013(b), and 8013(b) task the Secretaries with recruiting, organizing, training, and equipping the forces assigned to the combatant commands.

U.S. Joint Forces Command has been assigned the task of serving as the joint force provider and joint force trainer in the Unified Command Plan. The Secretary of Defense has also directed the command to serve as the lead agent for joint force transformation, the Joint National Training Capability, and for joint experimentation. The Service Components in the United States are assigned principally to Joint Forces Command for joint training subsequent to assignment to and utilization by other combatant commands. Therefore, all joint training requirements are based upon the entire range of combatant command missions. These joint training requirements and capabilities flow from the Joint Mission-Essential Task Lists (JMETLs) selected by the combatant commanders from the Universal Joint Task List.

In the Joint Training Manual for the Armed Forces of the United States, the Chairman of the Joint Chiefs of Staff has issued guidance to the combatant commands and their service components, Military Services, Combat Support Agencies, and Defense Agencies for developing JMETLs, planning and conducting joint training, and assessing command readiness with regard to joint training. The Military Services then develop training plans and capabilities to ensure that their forces are proficient in executing these mission essential tasks within their respective core competencies.

The Military Services maintain a comprehensive set of processes to develop, document, and execute current training requirements. These processes, which are described in greater detail below, typically link current training requirements to a standard training curriculum, which is based in turn on joint and Service-unique mission essential tasks. A wide variety of publications, such as doctrinal reports, guidance documents, instructions, and annual messages or updates, prescribe these processes thoroughly and precisely.

As the subsequent sections of this report demonstrate, encroachment limits the Department's ability to meet current Service core and joint training requirements. In some cases, encroachment prevents military forces from training to the standards established in these documents for current training requirements. In others, the Military Services are able to meet their established requirements for current training, but encroachment increases costs, reduces realism, forces practices in training that must be "un-learned" for actual combat operations, and segments training for multiple tasks, which degrades the quality of individual training evolutions.

Future joint training requirements can be grouped into two categories: near-term and long-term. Training requirements for the near-term future can be assessed with reasonable certainty because we can anticipate the near-term strategic environment, warfighting concepts, and technological capabilities with a reasonable certainty.

Indeed, DoD developed its Training Transformation Strategic and Implementation Plans precisely to address changing training requirements in the near-term future. These plans focus on improving joint knowledge development and distribution capability; establishing the Joint National Training Capability; and fostering the joint assessment and enabling capability for the continuous improvement of joint force readiness.

Over the long term, however, we have greater uncertainty about the strategic environment, warfighting concepts, and technologies, and, therefore, about the training that will be required to provide and maintain ready military forces.

With regard to encroachment in the long-term future, however, all of the trends and indicators point in the same direction: today's problems will worsen without appropriate action.

To meet long-term future training requirements, DoD will need at least as much in the way of air, land, water, and frequency spectrum resources as it uses today, and possibly more. In general, we will continue to maintain a decisive advantage over adversaries by being able to operate effectively during the day and at night, over greater distances, at greater speed, in all weather, with better intelligence, and with improved command, control, and communications. Training forces to become proficient in these advanced capabilities will likely increase requirements for airspace, land, sea area, and communications capacity.

The Department will continue to work collaboratively with other federal agencies, the Congress, the states, Native American tribes, local governments, host nations abroad, and nongovernmental

organizations to minimize the effects of encroachment on military training and readiness in the long-term future.

The next four sections discuss the training requirements of the Military Services.

2.1. Training Requirements

2.1.1. Army

The primary mission of the Department of the Army is to organize, train, equip, and provide forces for prompt and sustained combat on land, air, and in space. The Army deters potential adversaries, reassures allies and friends, and supports the nation at home.

Changes in the strategic environment and Army Transformation have important effects on training. From a strategic perspective, Army forces today use a "train, alert, and deploy" sequence. Maintaining forces that are ready now places increased emphasis on training. Due to political changes, advances in technology, and the Army's role in executing the National Military Strategy, military operations in urban terrain have taken on new dimensions that previously did not exist, and more attention must be given to training in urban environments. Transformation also affects Army training. As the Army maintains the current force and begins to field new weapon systems to support the Future Force, Army ranges must evolve to meet the new requirements to ensure the force remains responsive, deployable, agile, versatile, lethal, survivable, and sustainable.

The Army Master Range Plan identifies the training land, management, operations, and support for range instrumentation, targetry, and device requirements for approved range projects and Army range modernization requirements. The Integrated Training Area Management (ITAM) Program provides the Army with the capability to manage and maintain training lands by integrating mission requirements derived from the Army 's Range and Training Land Program with environmental requirements and management practices.

Only live events require use of ranges and training land. Live fire training exercises to include Combined Arms Field training exercises, maneuver training, and battle drills must be conducted under conditions that replicate actual combat as close as possible. This is especially true at battalion level and below. Virtual and constructive training cannot replace live training. They can, however, supplement, enhance, and complement live training to sustain unit proficiency. Based on resource availability (such as time, ammunition, simulators, and range availability), commanders determine the right mix and frequency of live, virtual, and constructive training to ensure efficient use of allocated training resources.

2.1.2. Navy

Navy range requirements ensure training ranges provide sufficient land, airspace, sea space, and frequency spectrum to complete Interdeployment Readiness Cycle (IDRC) training before Navy forces deploy from their home bases. Under IDRC, basic (unit) level training ensures the unit attains the proficiency needed for more complex or integrated training events. Intermediate training is event-driven and provides initial multi-unit training under simulated threats, usually during the Composite Training Unit Exercise (COMTUEX). Advanced training offers unfolding "scenario-driven" training providing live tactical training in a realistic, coordinated environment, culminating in an integrated Joint Task Force Exercise (JTFEX).

2.1.3. Marine Corps

Title 10 responsibilities are the touchstone for Marine Corps training requirements and range and training area management planning. Under Title 10, the Marine Corps (1) develops landing force amphibious tactics, techniques and equipment, (2) organizes, trains and equips to provide combined arms Fleet Marine Forces, and (3) organizes, trains, and equips Marine Corps forces to conduct prompt and sustained sea combat operations, land, sea, air, and space operations essential to a naval campaign, and amphibious training of all forces assigned to joint amphibious operations.

As articulated in *Expeditionary Maneuver Warfare* (EMW),(MCDP-1), EMW is the Marine Corps' capstone concept for developing tactics, forces, techniques and systems required by the operational context of the 21st Century. EMW operational concepts provide a roadmap for Marine Corps transformation. EMW capability requirements are driving development of weapons, systems, equipment and platforms; tactics, techniques, and procedures; and the training standards and associated range requirements. The Marine Corps' contribution to national security and its role within a naval expeditionary force rest upon five unique core competencies: (1) Warfighting Culture and Dynamic Decision-making, (2) Expeditionary Forward Operations, (3) Littoral Power Projection, (4) Combined Arms Integration, and (5) Forcible Entry from the Sea.

2.1.4. Air Force

The Air Force is the world's preeminent air power largely due to superior training of Air Force personnel. Air combat superiority is directly correlated with realistic training. The objective of realistic training of aircrews is to expose the warfighter to controlled training conditions that simulate combat as closely as possible, so that the experience of actual combat is not wholly unfamiliar. The effectiveness of the United States military's doctrine of realistic training is demonstrated by the dominance of the Air Force in every conflict in which it has been involved.

All air assets need properly configured and equipped ranges and airspace to practice a spectrum of skills, from the most basic to the most complex. The specific features of the training environment required for an aircrew to become skilled in a particular task differ greatly, including in the specific training objectives, the numbers and types of aircraft used, and the complexity of the interaction of different aircraft types in accomplishing a particular mission.

The Air Force training programs for aircrews uses a building-block approach, moving aircrews through six distinct types of training:

- **Undergraduate flying training.** Instructs aircrews in all aspects of basic flying proficiency.
- **Initial qualification training.** Provides instruction in the basic aircrew duties in an assigned position for a specific mission design series (MDS) for the aircraft to which the aircrew is assigned.
- **Mission qualification training.** Brings the aircrew through the point of being considered qualified to perform a command or unit mission.
- **Continuation training.** Provides aircrews with the recurrent training necessary to maintain proficiency at the assigned qualification level.
- **Special mission training.** Provides aircrews special skills required for specialized mission requirements.

- **Upgrade training.** Prepares the aircrew for advanced responsibilities, such as flight leader, instructor, or mission commander.

The types of training beyond basic levels differ in terms of complexity, goals, and number of participants, all of which influence the requirements for the ranges and training areas where the practical aspects of aircrew training are learned. Aircrew training is also viewed within the context of the operational concepts the training supports: readiness, deployment, employment, sustainment, redeployment, and reconstitution. This report focuses on mission qualification, continuing, and special mission training, involving employment, since these are the training stages that demand the most access to ranges.

The basis for aircrew training is the Ready Aircrew Program (RAP). The RAP is the source for specific information on the training requirements related to each MDS (i.e., aircraft type), including the number of sorties per training cycle, mission types flown, weapons employed, and other elements necessary for an aircrew to remain mission qualified. For each MDS aircraft, there are specific training requirements detailed in Series 11 Air Force publications.[7] An annual message from Headquarters, Air Combat Command, Directorate of Training (HQ ACC/DOT) sets specific minimum training requirements for each MDS.

2.2. Operational Training that Requires Ranges and Operating Areas

Many DoD training activities require access to ranges, SUA, and ocean operating areas. As a general principle, the larger the unit involved in the training activity, the larger the required training area. This is easy to see at the extremes: a brigade level training exercise in a realistic combat environment requires vastly more area than individual training for proficiency in small arms.[8]

The development of the JNTC reinforces DoD's requirements for range complexes, SUA, and operating areas. The JNTC is being designed to enhance joint force training to reflect the fact that we routinely fight as joint forces under the combatant commanders. Warfighting success today and in the future depends on our ability to deploy a joint force with decisive, overmatching combat power. As Admiral Edmund P. Giambastiani, Jr., Commander of the Joint Forces Command, recently testified before the House Armed Services Committee regarding the lessons learned during operation Iraqi Freedom:

> The fundamental point is that our traditional military planning and perhaps our entire approach to warfare has shifted. The main change, from our perspective, is that we are moving away from employing Service-centric forces that must be de-conflicted on the battlefield to achieve victories of attrition to a well-trained, integrated joint force that can enter the battlespace quickly and conduct decisive operations with both operational and strategic effects.[9]

Developing and maintaining a well-trained, integrated joint force requires exercising and coordinating these forces in live training at our range complexes and operating areas, augmented with virtual and constructive simulations. Advanced technologies will enable communication and coordination essential for the JNTC's mission success, but they cannot replace live training at our range complexes and in our

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7 *These Air Force publications can be accessed from the World Wide Web at http://afpubs.hq.af.mil.*

8 *There are exceptions. For example, pilots training for long range bombing, air refueling, or anti-submarine warfare missions need to fly long distances to complete their training missions.*

9 *Prepared statement by Admiral Edmund P. Giambastiani, Jr., Commander, United States Joint Forces Command and Supreme Allied Commander Transformation (NATO) before the House Armed Services Committee, United States House of Representatives, October 2, 2002, p. 4.*

operating areas and SUA. Training that requires ranges and operating area is described in detail in the next sections.

2.2.1. Army

Training strategies prescribe the events and standards for achieving and sustaining individual, crew, and unit readiness. The two main Army training strategies are the Standards in Training Commission (STRAC) strategies and the Combined Arms Training Strategy (CATS). These two strategies are the basis of unit collective training. STRAC and CATS provide highly-detailed strategies, standards, and requirements for training different types of Army units, such as armor, infantry, artillery, etc. Commanders use events in the STRAC and CATS strategies to develop their unit training plan to achieve and sustain proficiency in mission essential task lists (METL) tasks, taking into account the frequency, duration, conditions and standards in the strategies.

Based on the Army's training strategies and mission training plans, unit commanders develop unit specific training strategies to achieve and sustain proficiency in METL tasks. These strategies drive requirements for resources needed to conduct live training, including ammunition, OPTEMPO funding, and ranges and training land.

2.2.2. Navy

The Navy conducts most of its training on designated ranges and OPAREAs located near concentrations of forces in the United States, its territories, and overseas. This arrangement allows Navy units to train in controlled environs for high-quality training and safety. Overseas, the Navy has limited range and OPAREA space available, but the Secretary of the Navy's "At-Sea Policy" provides guidelines for training outside of designated OPAREAs in international seas and airspace.

2.2.3. Marine Corps

Marine Corps Training and Education is a structured continuum that provides combat-ready Marines, Marine units and Marine Air Ground Task Forces (MAGTFs). Training requirements constantly adapt to internal and external forces. The Marine Corps training and evaluation (T&E) continuum has five major parts: entry-level, common skills, skill progression, and unit training and professional military education. Marine Corps training is based on defined tasks, conditions, and standards focused on core competencies, is relevant in terms of expected missions and operational environments, and implements EMW doctrine and operational concepts. Training requirement development provides combat-ready units as the Nation's expeditionary force-in-readiness and the means to attain combat readiness across the spectrum of military operations. The goal is to develop unit warfighting capabilities, so Marine units can perform as part of a MAGTF, and the MAGTF can perform as part of a Joint Task Force.

The Marine Corps Combat Development Command (MCCDC) develops Marine Corps warfighting concepts. The Command manages the Expeditionary Force Development System (EFDS) – a system that develops and integrates Marine Corps doctrine, organizational structure, training and education, equipment, and support facilities required to field combat ready forces. The EFDS assesses current and future operating environments and involves continuous adaptation of training and education infrastructure and resources to develop capabilities and associated range, training area, infrastructure and instrumentation requirements.

The operational environment dictates training requirements and planning and T&E program execution. Future conflicts likely will occur in urban complexes, requiring a marked increase in the number and

types of tactical and operational tasks Marines must be trained to execute. Furthermore, Marine Corps forces will be increasingly visible and must limit collateral damage and ensure non-combatant safety. Success in this environment requires MAGTFs fully trained in a variety of operational capabilities. The current security climate necessitates extensive range transformations to guarantee accomplishment of such temporally and spatially evolving training requirements.

2.2.4. Air Force

The Air Force training programs for aircrews uses a building-block approach. Aircrews move through three distinct phases of training that differ in terms of complexity, goals, and number of participants, all of which influence the requirements for the ranges and training areas.

Primary training involves those basic air combat proficiency skills practiced at the Primary Training Ranges (PTR). The PTRs teach basic skills, such as training on proficient delivery of practice ordnance with limited integrated air defense system (IADS) and training in emitter signal recognition and countermeasures. Meeting the repetitive elements of basic aircrew training demands that these ranges be located in close proximity to the user's installation, or else significant costs are accrued in simply traveling to and from a central facility.

Intermediate training builds on the elements learned in basic training through use of a larger and more realistic training environment to execute more complex aircrew tasks and missions. Such training usually occurs at the Combat Training Centers (CTCs) or Combat Readiness Training Centers (CRTCs). Two examples of training conducted at these facilities are the use of real or simulated targets and more sophisticated IADS, which include multiple sources and types of threats (e.g., radar and infrared guided) and more accurate replication of IADS sensors and threats. Generally, intermediate training requires a larger operating space than primary training, in terms of both horizontal area and total airspace volume. The increased complexity of the training requirements met at these facilities requires additional supporting infrastructures (e.g., more personnel and facilities to service targets, IADS threat emitters.) The significant investment required to operate and maintain intermediate training facilities has limited their number; hence aircrews in intermediate training may have to travel longer distances.

Advanced training provides the most realistic environment. In general, advanced training involves many participants operating in a horizontally and vertically integrated force against full-scale, threat representative targets situated in realistic environments (e.g., urban terrain), with a high density, coordinated IADS defending them. The objective of advanced training is to provide as close to a real combat environment as possible, while ensuring safety of the public, aircrews, other Air Force personnel (e.g., ground crews), and the training infrastructure.

2.3. Command Relationships for Ranges and Range Complexes

Under Title 10 of the United States Code, the Military Services are primarily responsible for construction, repair, and maintenance of installations, including range complexes, subject to the authority, direction, and control of the Secretary of Defense.[10]

10 *Title 10 assigns to the Combatant Commanders responsibility for the joint training of forces under their command, but the Military Services maintain responsibility for the range complexes where these forces train. See 10 U.S.C. 164.*

Department of Defense Directive 3200.15, entitled "Sustainment of Ranges and Operating Areas (OPAREAs)," dated January 10, 2003, establishes policy and assigns responsibilities under Title 10 for the sustainment of test and training ranges and operating areas in the Department of Defense (see Appendix C). The Directive assigns substantial responsibilities for range sustainment to the Under Secretary of Defense for Personnel and Readiness; the Under Secretary of Defense for Acquisition, Technology, and Logistics; Director of Operational Test and Evaluation; the Military Services; and Defense Agencies. The Directive also assigns responsibilities to the Chairman of the Joint Chiefs of Staff, the Under Secretary of Defense for Policy, the Assistant Secretary of Defense for Public Affairs and the Assistant Secretary of Defense for Legislative Affairs.

The Department has taken additional steps to ensure sound management, implementation and coordination of sustainable range responsibilities. The Senior Readiness Oversight Council (SROC) reviews range sustainment policies and issues. DoD created an Integrated Product Team (IPT), which is led by the Office of the Under Secretary of Defense for Personnel and Readiness and reports to the SROC, to act as the DoD coordinating body for developing strategy to preserve the military's ability to train. A Working IPT, co-chaired by the Office of the Deputy Under Secretary of Defense for Readiness, the Office of the Deputy Under Secretary of Defense for Installations and Environment, and the Office of the Director of Operational Test and Evaluation meets regularly and reports to the IPT. The remainder of this section describes command relationships within the Military Services.

2.3.1. Army

The Headquarters Department of the Army (HQDA) Deputy Chief of Staff (DCS) G-3 has the responsibility as the Army Trainer to establish the priorities and requirements for Army ranges and training lands, plan for their modernization and expansion, and formulate policy for their operation and management. The G-3 at HQDA directly manages and funds the Range and Training Land Program (RTLP). The program consists of range modernization and range operations, as well as the ITAM program, which provides the capability for land management and maintenance.

The HQDA Assistant Chief of Staff for Installation Management (ACSIM), as the Army's overall installation manager, establishes the policy guidance and procedures for installation operations, real property management, and environmental stewardship for all activities and functions within Army garrisons. In that regard, components of the G-3's RTLP and ITAM programs are synchronized with ACSIM's installation management policies as well as with the Army's Range Safety Program, under the direction of the HQDA, Director of Army Safety, and Munitions Management program, under the direction of the HQDA DCS, G-4.

The G-3's priorities and requirements for Army ranges and training lands, as well as day-to-day range operations, are executed at the installation level by garrison staff. Responsibility typically resides within the Directorate of Plans, Training, and Mobilization (DPTM), who reports directly to the garrison commander. The garrison commander operates under the direction of the Army Installation Management Agency's (IMA) regions, which in turn operate under the direction of IMA. Because the Army's training missions are the responsibility of the Major Commands (MACOMs), these organizations also play a role in establishing requirements and priorities for the Sustainable Range Program (SRP).

Mission commanders retain the mission to ensure Army units are trained and ready to fight and win our Nation's wars. As such, senior mission commanders on each installation establish and approve the requirements for ranges and training land that are forwarded through the MACOM to HQDA Office of the Deputy Chief of Staff (ODCS) G-3.

Because ranges are simultaneously integral to installations as both facilities and mission training assets, range control and management require a truly integrated approach. Mission and Garrison Commanders work in coordination with the proponent for Ranges and Training Land, ODCS G-3, and the ACSIM to analyze the adequacy of ranges and training lands to support the mission commander's METL training requirements.

2.3.2. Navy

For administrative purposes, Navy ranges are grouped in geographic complexes. While the specific ranges within those complexes may have different operational chains of command, they have common administrative requirements, such as environmental support, that are unique to each region. Validation of requirements for all training ranges in the United States and its territories falls under the purview of Commander, Fleet Forces Command (CFFC). Various Fleet and Type Commanders control ranges as tenants on the installations where they reside. The Navy has also established a headquarters-level single Range Office with oversight over all Navy ranges, replacing a previously fragmented organizational approach to these responsibilities**.**

2.3.3. Marine Corps

.To coordinate training and education programs, the Training and Education Command (TECOM) was established within the MCCDC in July 2000. Range and installation oversight is accomplished via coordination between the Range and Training Area Management Division (RTAM) of TECOM, and the Deputy Commandant of Installations and Logistics (Logistics and Facilities) (DC I&L (LF)) at Marine Corps Headquarters. RTAM is the executive agent charged with developing systems, operational doctrine and training requirements for Marine Corps forces. DC I&L (LF) has broad responsibilities for all aspects of installation and facilities planning, management and investment. Synchronizing these efforts ensures mission-capable operational ranges are available throughout the Marine Corps.

2.3.4. Air Force

HQ USAF, Deputy Chief of Staff, Air and Space Operations, through the Director of Operations and Training, has designated the Ranges and Airspace Division (HQ USAF/XOO-RA) as the focal point for USAF ranges. The Ranges and Airspace Division develops policy, advocates resources, and manages the oversight of Air Force ranges.

2.4. Current Range Requirements Derived from Training Requirements

This section summarizes current range, operating area, and airspace requirements derived from training requirements.

2.4.1. Army

The Army uses the RTLP process to plan, estimate, and program for the live training facilities (ranges and maneuver/training area) needed to meet its live training requirements. There are two tools used to accomplish this. The first is the Army RTLP Requirements Model (ARRM). ARRM is an automated database that calculates and compares live training assets and requirements. ARRM compares these two data sets and identifies training capacity shortages and excesses of an installation by individual training facility. The second tool is the Installation Training Capacity (ITC) Methodology. It is a standard methodology used to analyze the live training capability of Army installations. It shares the same

database as ARRM, but also includes an evaluation and scoring capability, and a "what if" capability that allows for changes to requirements and assets. Additionally, the ITC contains a two-part qualitative assessment of specific mission essential live training facilities and demographic and environmental factors that affect live training.

The ARRM calculates training requirements for major Army units and schools, including specific training events required, the number of times each needs to be performed, required maneuver acreage, and the duration of each event. It develops total installation land requirements for institutional training (i.e., schools) and operational training (i.e., units). The ARRM calculates maneuver area requirements and range requirements. The ARRM allows the Army to develop detailed training requirements from standard databases and established doctrinal standards.

2.4.2. Navy

To meet IDRC requirements, the Navy has a geographically dispersed set of training complexes on each U.S. coast that provide the areas required to conduct controlled and realistic training scenarios. Today's high-performance aircraft and ships employ weapons of greater capability and complexity, with unique delivery tactics requiring a robust training range/OPAREA infrastructure.

2.4.3. Marine Corps

The Marine Corps requires access to ranges, training areas and airspace that is sufficient to support training to standards across the training continuum. The ultimate objective of Marine Corps training is to provide mission-capable MAGTFs. MAGTF training requirements determine range and training area requirements. The Marine Expeditionary Unit (Special Operations Capable), or MEU(SOC), is the standard, forward deployed MAGTF. Current training requirements for the MEU(SOC) include the following Core Capabilities: Amphibious Operations, MEU-level Maneuver Ashore, Combined-arms Operations, Maritime Special Operations, Military Operations Other Than War (MOOTW), and Supporting Operations. Within these core capabilities, the MEU(SOC) trains to accomplish a spectrum of METs and crisis response operations including over 20 mission areas. Additionally, the Marine Expeditionary Brigade (MEB) is the Marine Corps primary contingency response force and is the smallest MAGTF capable of forcible entry operations. As such, the MEB must be trained in mission essential tasks required of the primary operational-level warfighting force in the theater of operations.

As the Marine Corps' principal warfighting organization, the Marine Expeditionary Force (MEF) must train to conduct and sustain expeditionary operations in any geographic environment. Current training requirements for the MEF, as established in the Marine Corps Task List (MCTL), are (1) conduct MEF maneuver, (2) conduct intelligence operations, (3) employ and coordinate fires, (4) perform logistics and combat service support, (5) exercise command and control, and (6) train in force protection.

2.4.4. Air Force

The Air Force groups its range complexes into three categories: Primary Training Ranges; Combat Training Centers and Combat Readiness Training Centers; and the Major Range and Test Facility Base. These categories reflect the different types of ranges that are required to meet Air Force training requirements. The land space, air space, targets and target arrays, and systems for simulated integrated air defense, scoring, and feedback grow increasing large or complex in the progression through the range categories.

For example, the land space at Primary Training Ranges is generally sized to support basic training events, but often limits the delivery of weapons. For Combat Training Centers and Combat Readiness Training Centers, the land area is generally determined by sensor ranges, with terrain representative of threat areas. For the Major Range and Test Facility Base, the land space is large enough for tactical maneuvers in coordinated, multi-platform, multi-warfare area operations.

Appendix D provides a summary comparison of the types of Air Force ranges, the types of training each can support, and information of different characteristics each range type has to support training.

2.5. Future Range Complex Requirements

Many factors will influence future range complex requirements, and the following sections discuss near-term and long-term future projections for Military Service training range requirements. Two of the most important factors will be the development and implementation of the Joint National Training Capability and the need to establish range requirements that reflect the Department's sustainable ranges initiative.

2.5.1. Army

The Army is planning, programming, and implementing necessary range modernization to accommodate the transformation of six current force units to STRYKER Brigade Combat Teams (SBCTs). The SBCT is an infantry-centric unit with 3,600 soldiers that combines many of the best characteristics of the current Army forces and exploits technology to fill a current operations capability gap between the Army's heavy and light forces. The Army is identifying and addressing potential shortfalls in live-fire training facilities for the SBCTs using the Range and Training Land Program (RTLP) requirements process.

The vision of Army training in 2010 is a networked organization engineered to meet institutional, unit, and modernization training needs for the Army. Training will remain focused on wartime missions. Realistic, sustained, multi-echelon, and totally integrated training will be stressed at all levels. Virtual and constructive simulations and simulators will support the achievement and sustainment of training readiness in units. The vision is to build synthetic training environments, integrate them with live training, and use automated training management tools to provide trainers with a menu of structured exercises, to include mission-rehearsal capabilities, driven by a flexible, METL.

By 2015, the Army will have transformed to the Future Force. The FF is characterized by an integrated Joint, Interagency, and Multinational (JIM) Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architecture, a revolutionary architecture with linkages to the current, STRYKER, and JIM forces. FF systems support decisive dominant maneuver – horizontal and vertical, day and night – in all weather and terrain as dismounted or mounted combined arms teams and provide the best combination of low-observable, ballistic protection, long-range acquisition and targeting, and first round hit-and-kill technologies.

Based on the Operational and Organization (O&O) Plan for the FF Maneuver Unit of Action, the System Training Plan for the Future Combat System, and the System Training Plan for the Future Infantry Combat Weapon (FICW), the Army estimated the live training requirements for the Future Combat System (FCS) Equipped Unit of Action (UA) and facilities necessary to support those requirements.

Army installations that may become home stations for FF UAs will be evaluated against live training facility requirements. By estimating these requirements early in the transformation process, the Army can make efficient use of existing installation resources when making Future Force stationing decisions and

plan and program for future facility modernization requirements. The Army has made no stationing or sequencing decisions for transforming current units to the FF.

2.5.2. Navy

Navy training ranges will continue to play a critical role in supporting IDRC training for operational forces. Strategic planning for Navy range complexes will include future training operations derived from new Naval platforms and weapons, as well as improvements to infrastructure to support the JNTC. These issues will be addressed in the forthcoming Navy Fleet Training Range Strategy and individual Range Complex Management Plans (RCMPs) under development for each Navy range complex under the Tactical Training Theater Assessment and Planning (TAP) program. In conjunction with the development of RCMPs, a Range Capabilities Document (RCD) will be created to assess the infrastructure and technological needs of ranges to support specific warfare areas. The Navy will use these plans to implement the Office of the Secretary of Defense Sustainable Range Guidance, and evaluate new requirements throughout the planning, programming, budgeting, and execution process.

2.5.3. Marine Corps

Future tactics, techniques, procedures, and training requirements are evolving to leverage new capabilities. The Marine Corps T&E continuum will evolve to meet these diverse and changing operational needs. Capabilities for Expeditionary Maneuver Warfare (EMW, the Marine Corps' capstone concept for the early 21st Century) will enhance MAGTF mission capabilities. Future MAGTF training requirements will be driven by expected operational contexts and EMW operational concepts, and likely will be characterized by: (1) extended-range training operations to exercise EMW capabilities, (2) MEB live-fire and maneuver exercises, (3) increased Military Operations in Urban Terrain (MOUT) training requirements, (4) enhancement of T&E through instrumented ranges and target systems, (5) increased reliance on MAGTF sustainment training during deployment, and (6) increased joint training.

The *Strategic Plan*, *Management Initiative Decision (MID) 906,* approved by the Deputy Secretary of Defense (January 2003), specifies seven major JNTC training centers for FY 03-05: the Marine Air Ground Task Force Training Command (MAGTFTC), 29 Palms; U.S. Army National Training Center; Joint Readiness and Training Center; Fort Bliss Exercise Roving Sands training range; U.S. Navy Fleet East training area; U.S. Navy Fleet West training area; and U.S. Air Force Nellis test and training ranges. Additional instrumentation is needed to integrate MAGTFTC into the JNTC; *MID 906* provides substantial funding for design and development of advanced training technologies and emphasizes that allocations are not for "[b]asic service modernization efforts."

The Marine Corps is committed to full JNTC participation, and required range capability planning is underway. TECOM leads Marine Corps JNTC initiatives, supported by the Marine Corps Systems Command (MARCORSYSCOM) and the Bases and Stations. TECOM (G-3) leads the Marine Corps' JNTC exercise design and requirement identification process for participating range certification and chairs the Range Instrumentation System Working Group (RISWG), which develops policies, priorities and requirements for Range Instrumentation Systems implementation. TECOM–Technology Division (Tech Div) is the lead for range instrumentation technology and plays key roles in range modernization programs and JNTC. Tech Div develops range instrumentation requirements documents and coordinates with MARCORSYSCOM to support RISWG requirements and with other Services to support Range Instrumentation System design and acquisition. Tech Div is actively developing requirements jointly with the Army. In conjunction with the Tactical Training Exercise Control Group at 29 Palms, RTAM develops requirements and priorities for range instrumentation, modernization and investment. RTAM also defines range instrumentation requirements of other Marine Corps bases and stations for inclusion in the budget process and coordinates with TECOM Tech Div to identify solutions to requirements

developed by the RISWG. Aiding this process in the future will be the RTAM-initiated RCD range requirements assessment. This document, to be completed in the first quarter of FY04, describes current and anticipated range training requirements and will be critical to range transformation efforts. Marine Corps Bases and Stations, with TECOM G-3, TECOM Tech Div, and RTAM, identify training range modernization requirements and assist in budget development.

The Marine Corps' premier combined-arms training center, 29 Palms, is one of the initial JNTC venues identified in MID 906 and will be linked with other Service's major Western Range Complex JNTC training centers. To meet JNTC objectives, significant planning and substantial investment supporting enhanced MAGTF training in the Combined Arms Exercise (CAX) Program will be required. To develop, program, and establish a Range Instrumentation System at MAGTFTC to enhance combat realism, present a realistic Opposing Force (OPFOR) profile, and provide ground truth and feedback is a priority. These initiatives support the CAX Program and will meet the criteria for JNTC accreditation. Pursuant to Training Transformation guidance, the MAGTFTC Range Instrumentation System is to be included in future budgets, so that fully instrumented CAX training at 29 Palms is possible by FY 2008.

2.5.4. Air Force

Whenever there is a change in air power doctrine or introduction of a new weapons system, the design, location, and infrastructure supporting training ranges and related airspace must be updated and new training must be developed. In general, this relationship occurs in two steps: first, there is the change in doctrine or systems; second, there are changes in the supporting training infrastructure.

As changes in equipment and doctrine are made they are translated into specific tasks that aircrews must master. This process occurs during development of the Mission Area Plans (MAPs) for each of the core competencies of the Air Force: Air and Space Superiority; Information Superiority; Global Attack; Precision Engagement; Rapid Global Mobility; and Agile Combat Support. The MAPs identify key training events to allow for comparison against existing infrastructure and force-basing plan. From such an analysis, it would be possible to quickly and efficiently identify any limitations in the existing infrastructure that would constrain the ability of a unit to meet its new training objectives. Using new processes the Air Force has been able to translate key emerging operational capabilities and tasks identified in the MAPs into training capabilities and tasks required for ranges and airspace.

The F/A-22 and Joint Strike Fighter (JSF) are the next generation in fighter aircraft, and have unique capabilities that result in new infrastructure needs in areas as diverse as environmental compliance and IADS simulation. Similarly, the Unmanned Aerospace Vehicle (UAV) and Unmanned Combat Aerospace Vehicle (UCAV) will undoubtedly drive changes in military flight training. Infrastructure changes required to support these systems are still being documented; however, modernization initiatives are in place to improve supporting infrastructure.

In addition to requirements driven by the introduction of new aircraft, introduction of new or improved weapons can also result in changes in the supporting testing and training infrastructure. Among the recently developed weapons are the Joint Direct Attack Munition (JDAM) and the Joint Stand-off Weapon (JSOW). New weapons are becoming ever more precise, have an increased standoff distance, and have very large Weapons Safety Footprints that cannot normally be contained on PTRs. Such changes result in significantly different requirements related to the design and configuration of ranges where aircrews will practice with these weapons deliveries. Introduction of more advanced weapons, such as directed energy weapons and airborne lasers will change the physical layout of ranges and affect other aspects of testing and training range operations such as target array design, attack profile configurations, and the ability to operate over additional lands owned by other stakeholders.

Finally, the increasing importance of integrated air, space, and information operations (ASIO) will drive changes in testing and training requirements. As these technologies advance, the need for a full integration of ASIO with current air operations training increases. As this integrated testing and training matures, the complexity and fidelity of the range and airspace requirements will expand.